MCP361 Industrial Engineering Lab: Assignment 4

<u>**Due date: 9:00 AM August 21, 2024**</u>

— **Naming convention for files for this assignment is as follows.**
  MCP361_Entry#_Assignment4.py
 **MCP361_Entry#_Assignment4.pdf**

— **Submit a zip file to Moodle named as follows.**
  MCP361_Entry#_Assignment4.zip

Remember the general guidelines for the assignments given at the start of the course.

[6 marks] Code a **generic** Python script that automates BOM explosion. Refer to the Factory Physics book.

The user inputs will include demand over the planning horizon (for this assignment, we have taken 8 time periods, but your code should be able to handle cases in general), available on-hand inventory and a list of scheduled receipts due in the planning horizon for each BOM item. The list of scheduled receipts will be input as an array/list (e.g., [20,10]). Ignore the time periods when the SRs are due, and just use the order in the list as the order of arrival. Refer to the network diagram below.
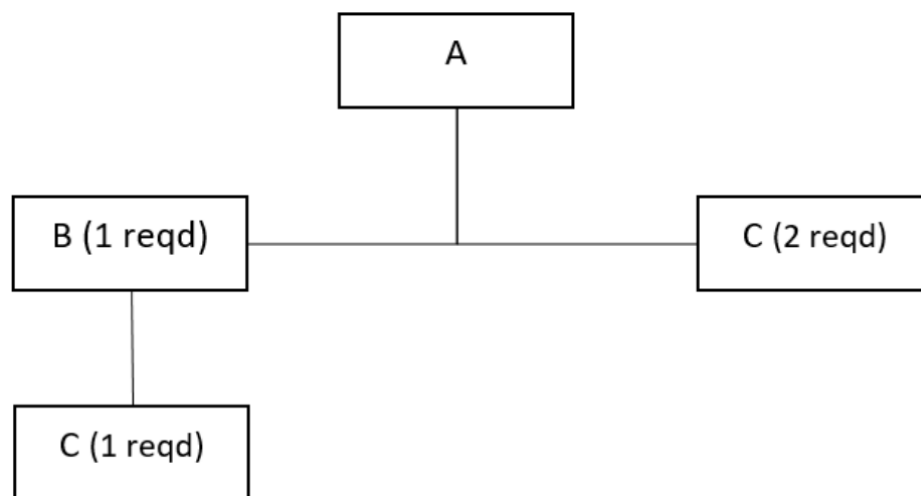
For each item, write the code that outputs the net requirements for each item over the time horizon.

Item A:

Demand (units) = [15, 20, 30, 10, 30, 30, 30, 30]

Available on-hand inventory = 30

Scheduled receipts = [20, 10]

Item B:

Available on-hand inventory = 60

Scheduled receipts = [10]

Item C:

Available on-hand inventory = 60

Scheduled receipts = [20,10]

[1 mark] You must figure out a **generic** format in which the BOM dependencies and inputs must be specified in your code, and how you will use the input according to your specified format to solve this problem. You must **describe** the format used in PDF.

[1 mark] For this assignment, assume a lot-for-lot production policy with zero lead time. But if these two assumptions were not satisfied, **explain** in the PDF what two additional quantities must be calculated and why.

[2 marks] **Find** the final answer by hand and show the steps in the PDF. *Your code output should match this manually obtained answer.*